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(54) **METHOD AND APPARATUS FOR PARENTAL CONTROL**

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U.S. Appl. No. 60/076,290, filed Feb. 27, 1998.\*

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 1077 days.

\* cited by examiner

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**Related U.S. Application Data**

(57) **ABSTRACT**

(60) Provisional application No. 60/566,296, filed on Apr. 28, 2004.

Television converter devices in accordance with present invention determine whether the programming is to be blocked or not, then inserts an appropriate V-code into the vertical blanking interval (VBI) of the programming before delivering the programming to one or more V-chip enabled TV where the V-chip blocks the programming as appropriate. Various methods of determining whether the programming is to be blocked are disclosed.

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**H04N 7/16** (2011.01)

(52) **U.S. Cl.** ..... **725/28; 725/25; 725/27; 725/31**

(58) **Field of Classification Search** ..... **725/25, 725/27, 28, 30, 31**

See application file for complete search history.

**39 Claims, 8 Drawing Sheets**



PCS Code	Description	Corresponding V-Code
A	Coarse Language	TV-PG
B	Limited Violence	TV-PG
C	Suggestive Sexual Dialog	TV-MA
D	Suggestive sexual Situations	TV-MA
E	Strong Language	TV-14
F	Moderately Intense Violence	TV-14
G	Sexual Dialog	TV-MA
H	Sexual Situations	TV-MA

Reference numerals: 502 points to PCS Code column, 512 points to Description column, 504 points to Corresponding V-Code column, 506 points to TV-MA rows, 510 points to TV-MA rows, 508 points to C and D rows.

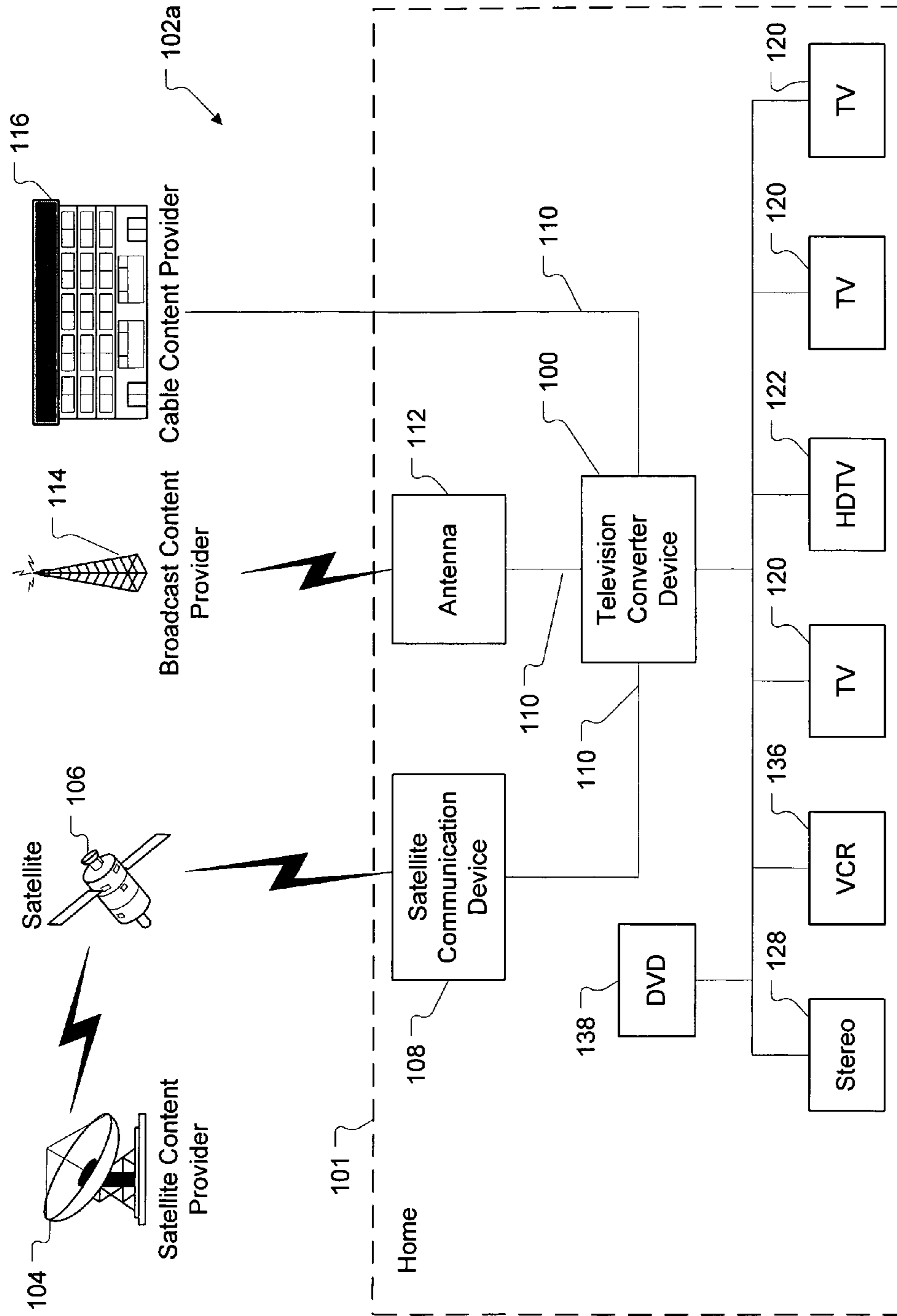


FIG. 1a

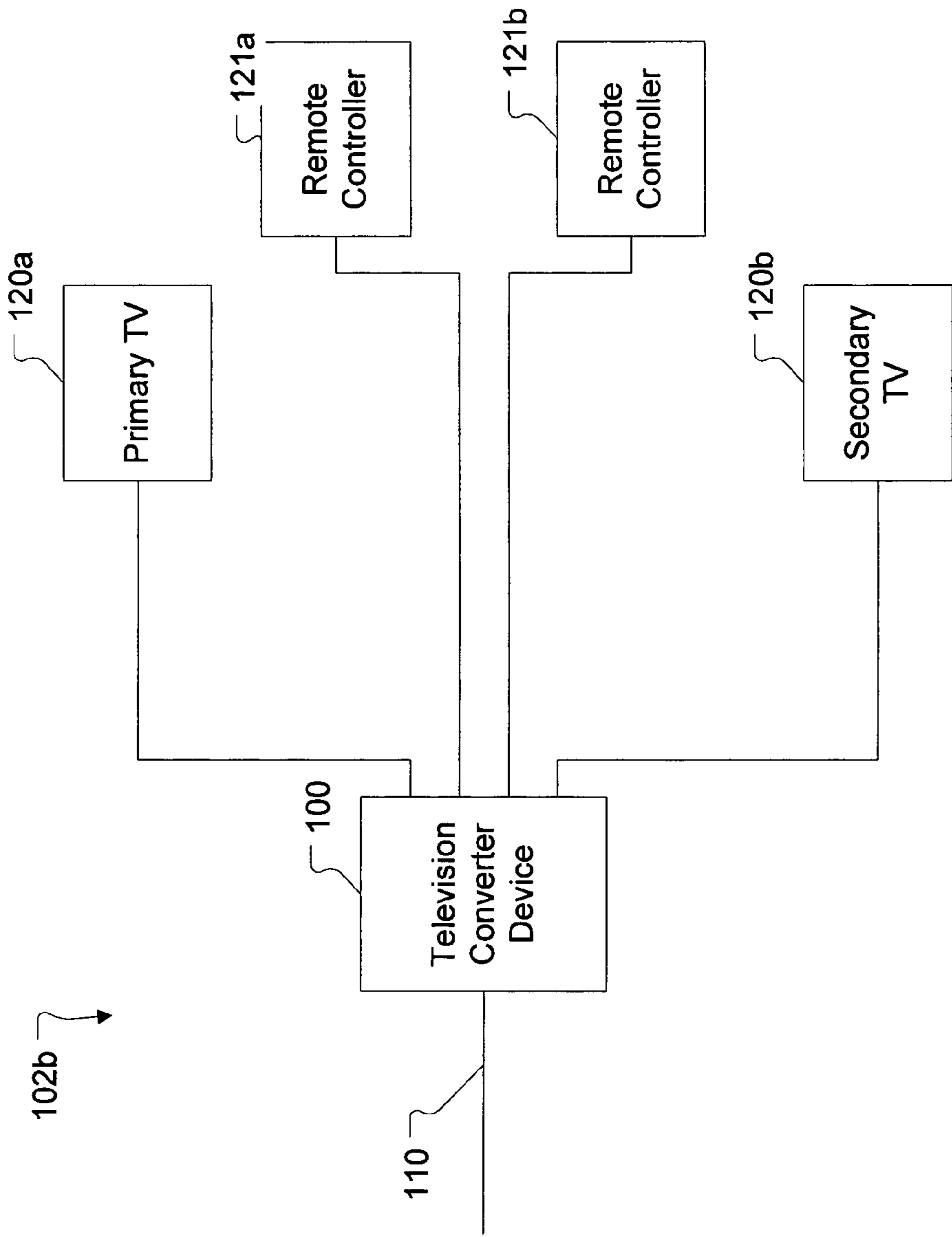


FIG. 1b

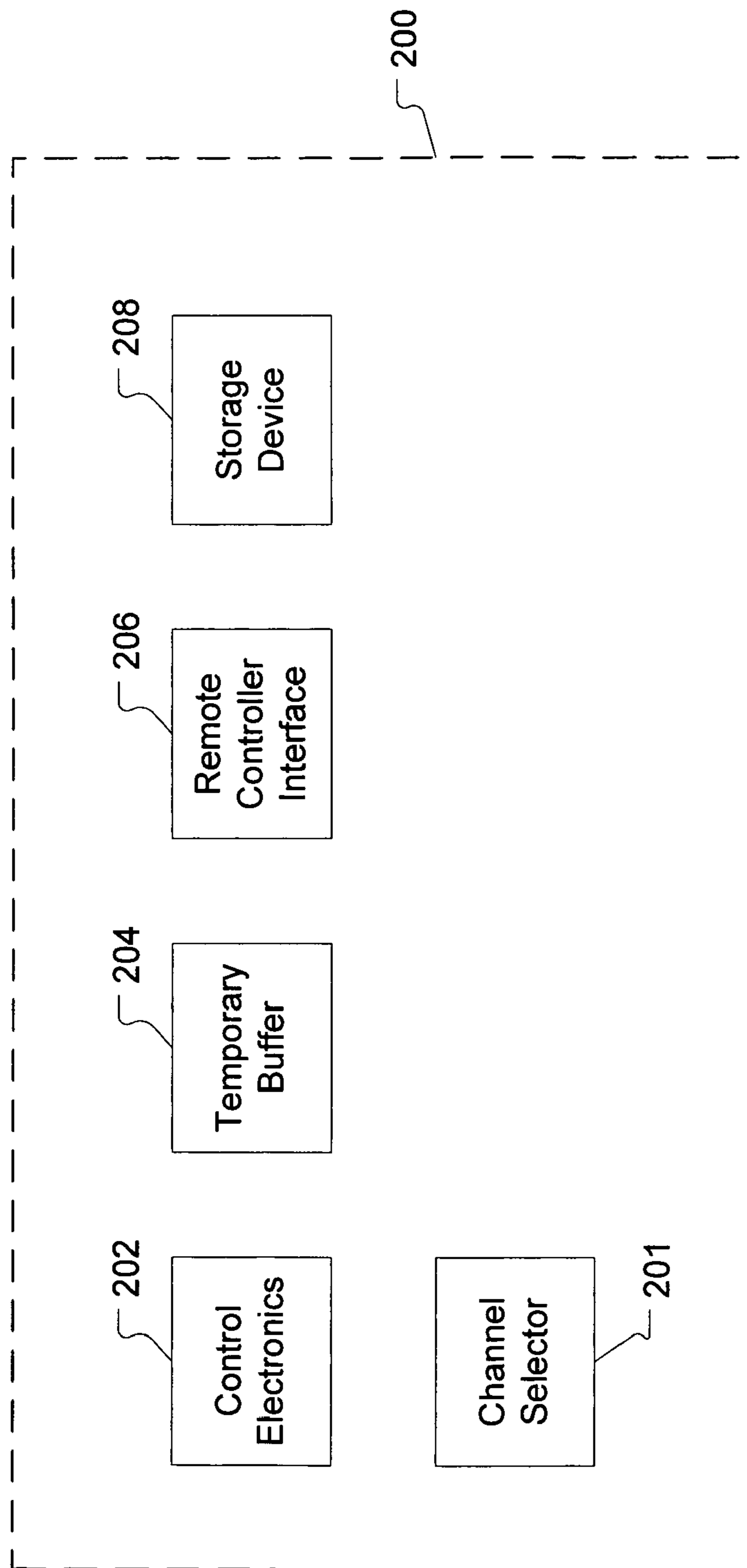


FIG. 2

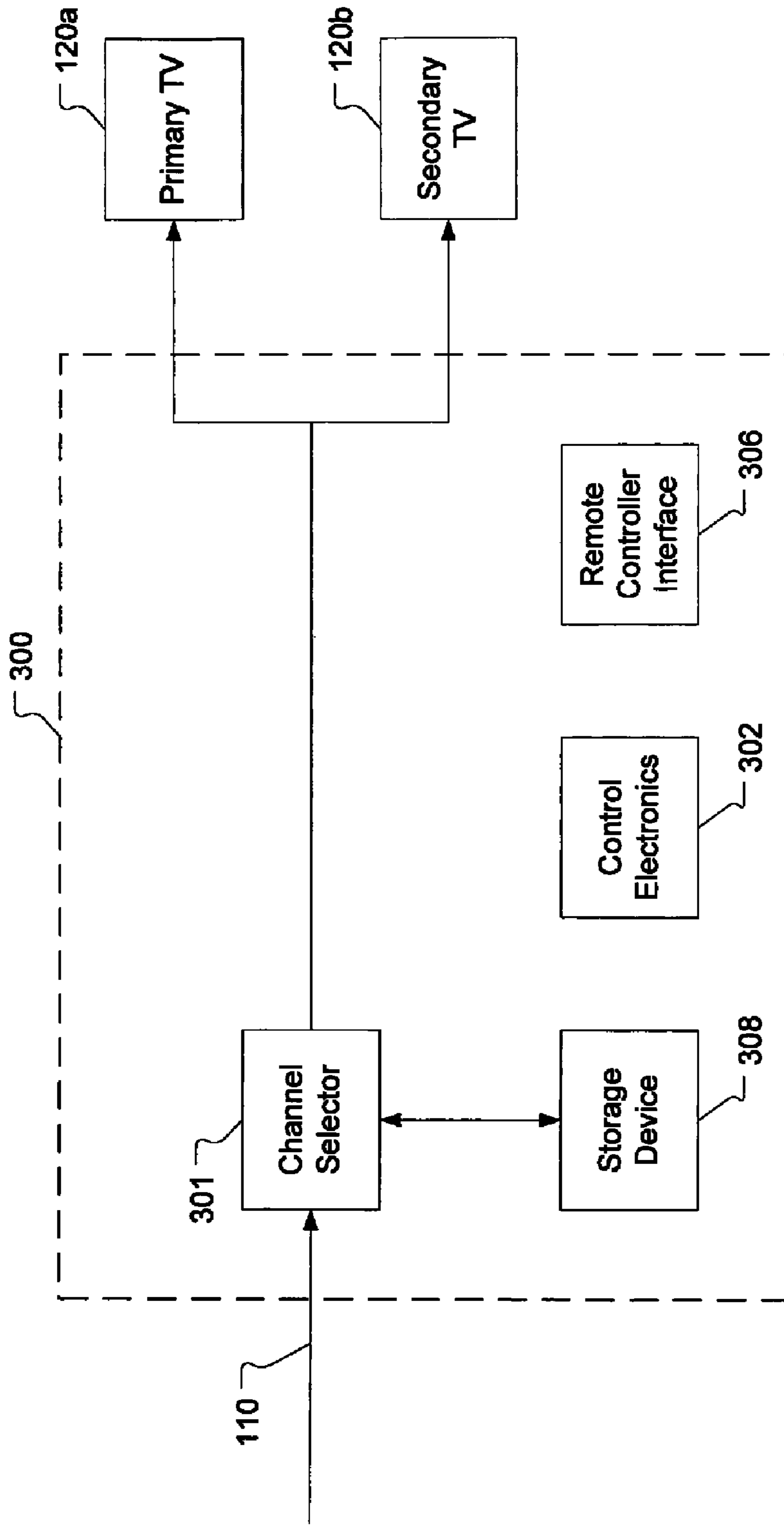


FIG. 3

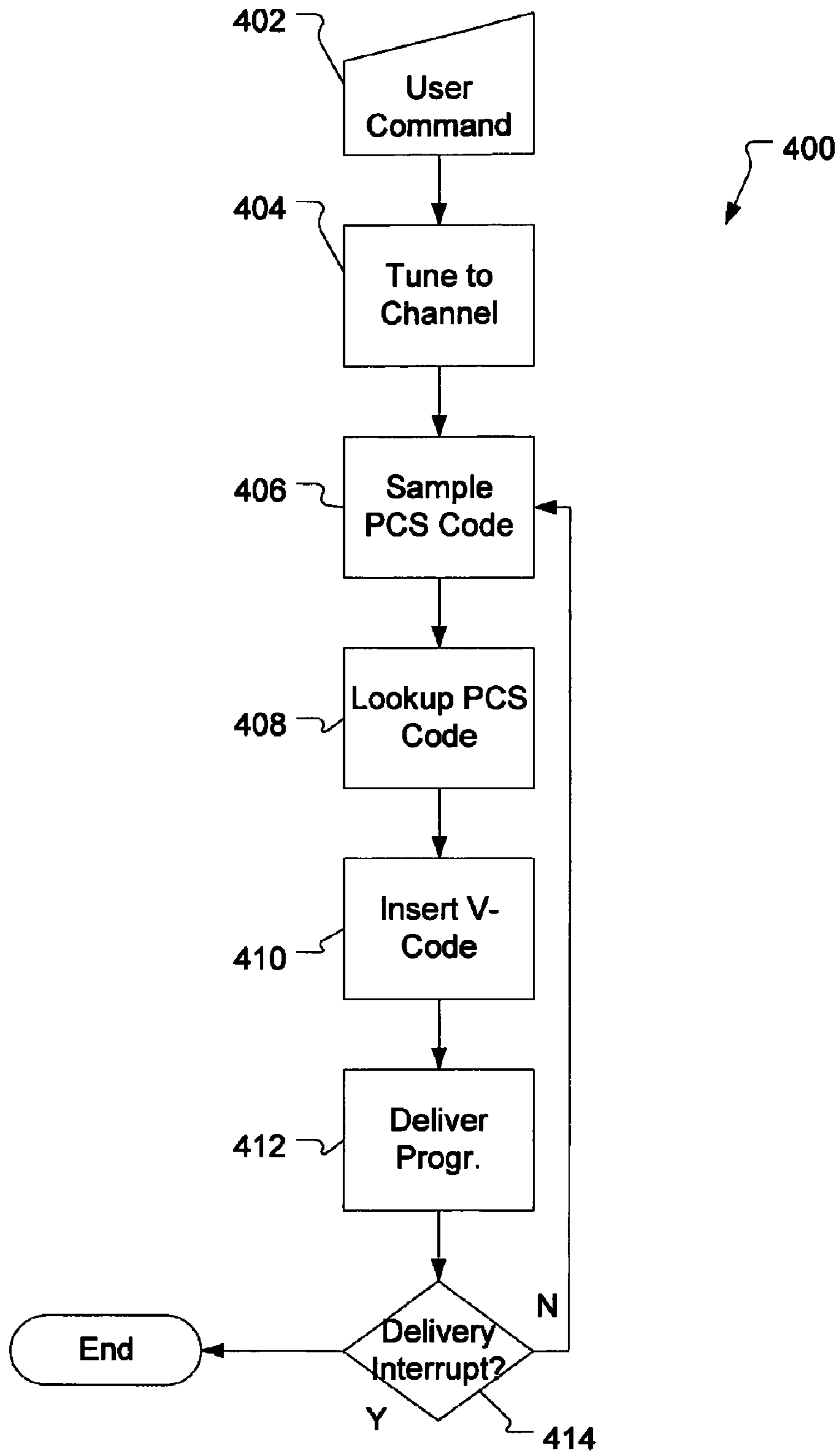


FIG. 4

500

PCS Code	Description	Corresponding V-Code
.	.	.
.	.	.
.	.	.
502 → A	Coarse Language 504	TV-PG 506
B	Limited Violence	TV-PG
C	Suggestive Sexual Dialog	TV-PG
D	Suggestive sexual Situations	TV-PG
E	Strong Language	TV-14
F	Moderately Intense Violence	TV-14
G	Sexual Dialog	TV-14
H	Sexual Situations	TV-14
.	.	.
.	.	.
.	.	.
.	.	.

FIG. 5a

500

PCS Code	Description	Corresponding V-Code
502	512	506
A	Coarse Language	TV-PG
B	Limited Violence	TV-PG
C	Suggestive Sexual Dialog	TV-MA
D	Suggestive sexual Situations	TV-MA
E	Strong Language	TV-14
F	Moderately Intense Violence	TV-14
G	Sexual Dialog	TV-MA
H	Sexual Situations	TV-MA
512		

FIG. 5b



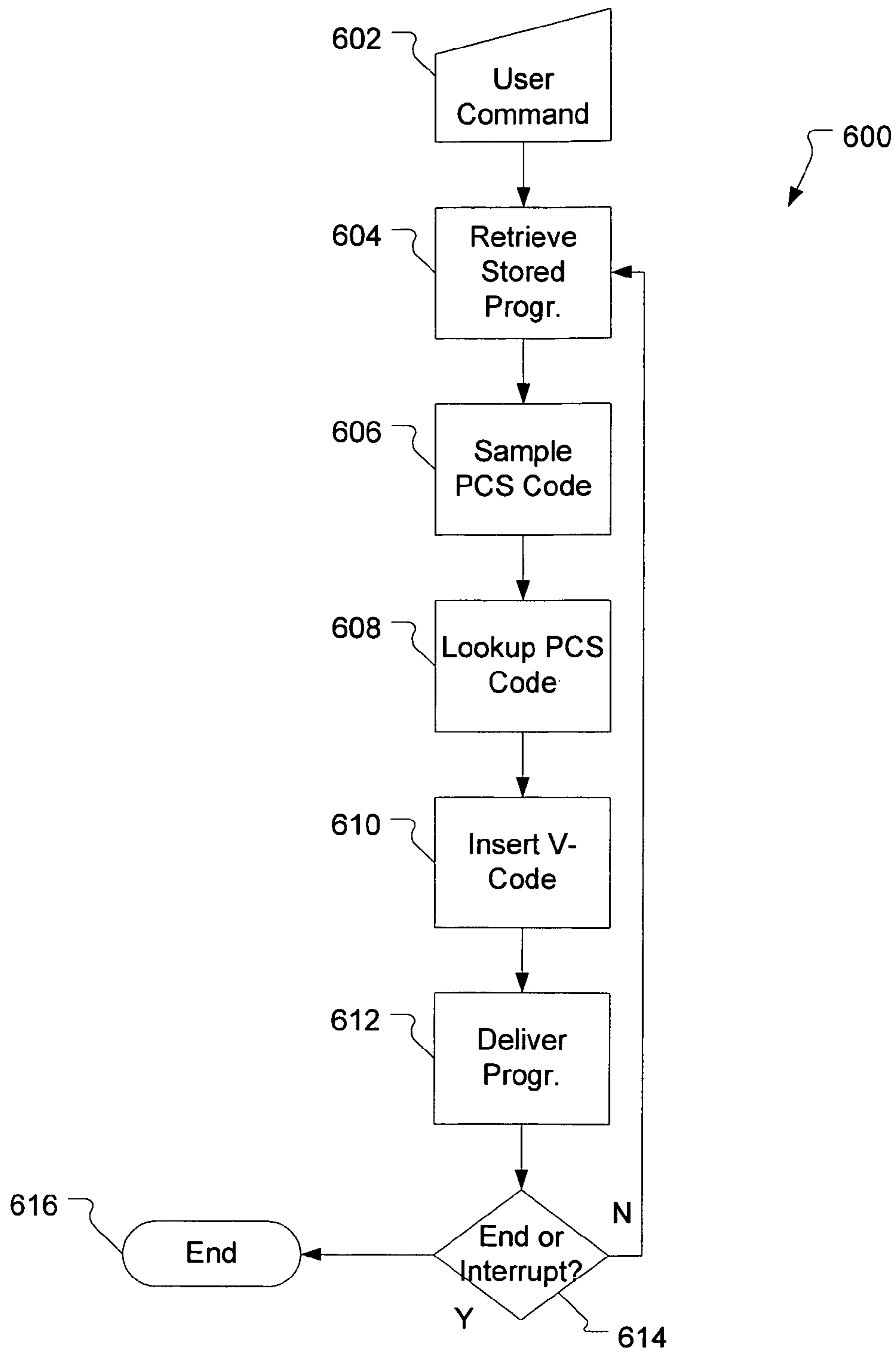


FIG. 6

## 1

**METHOD AND APPARATUS FOR PARENTAL CONTROL**

## RELATED APPLICATIONS

This application claims priority to U.S. Provisional Application Ser. No. 60/566,296, titled METHOD AND APPARATUS FOR PARENTAL CONTROL filed Apr. 28, 2004, which application is hereby incorporated herein by reference.

## FIELD OF THE INVENTION

The present invention relates to a method of controlling the display of television programming. More particularly, the invention relates to a method for independently blocking selected programming to one or more televisions connected to a television converter device at a subscriber location.

## BACKGROUND OF THE INVENTION

Parental controls are used to limit access to content, such as violent or adult-themed programming. Typically, parents use parental controls to limit access of their children to programming which the parents have decided are inappropriate. Today, most televisions and television converter devices used in entertainment systems are equipped with some form of parental control. In addition to government mandated V-chip method, many subscriber-based content providers, such as cable television and satellite television providers, include their own parental control means as features within the television converter devices or other equipment that they provide to subscribers. However, the current means for instituting parental controls, be they V-chip based or part of a subscriber-based content provider system, are inadequate because of advances in television technology and inherent limitations in the current parental control technology.

Probably the most common parental control means is known as the V-chip method. A V-chip is a device that is now standard in TV sets sold in the United States. As of 1999, all new television sets (over 13 inches/33 cm) sold in the United States must contain a V-chip. The "V" stands for "violence," and the goal of the chip is to allow parents to choose the level of violent TV programming that will be allowed into the home. The V-chip samples data contained in the vertical blanking interval (VBI), also known as the line 21 data area, of a standard television signal pertaining to the nature of that program in which they are embedded. These data, known as V-codes, are used by the V-chip to determine whether to show the programming on television or not. The V-chip samples the V-code and compares it to a pre-selected blocking level. If the rating of the programming exceeds the preset blocking level, the V-chip does not allow the TV to display the programming (i.e. it is blocked). Parents use an access code, which presumably only they know, to select from an on-screen menu a blocking level that they deem appropriate for the TV's user.

The V-chip method for parental control has become popular because of its ubiquitous nature. However users are limited to the V-chip system of classifying content. The V-chip system uses a rating system loosely based on the Motion Picture Association of America (MPAA) rating system to classify television programming, using such codes as TV-Y, TV-Y7, TV-G, TV-PG, TV-14, and TV-MA (see Table 1) to classify all television programming. In essence, these are the blocking levels available. Because these relatively broad classifications are being used to classify the entire spectrum of television programming, users are often unable to lock out certain specific programs, or even types of programming,

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without locking out other programming which they do not find offensive, but which happen to share the same rating. This is a problem with the current V-chip method.

TABLE 1

V-Chip Ratings and Descriptions	
TV-Y	All Children - This program is designed to be appropriate for all children. The themes and elements in this program are specifically designed for a very young audience, including children from ages 2-6.
TV-Y7	Directed to Older Children - This program is designed for children age 7 and above. It may be more appropriate for children who have acquired the developmental skills needed to distinguish between make-believe and reality. Themes and elements in this program may include mild physical or comedic violence.
TV-G	General Audience - Most parents would find this program suitable for all ages. Although this rating does not signify a program designed specifically for children, most parents may let younger children watch this program unattended. It contains little or no violence, no strong language and little or no sexual dialogue or situations.
TV-PG	Parental Guidance - This program may contain some material that some parents would find unsuitable for younger children. The program may contain infrequent coarse language, limited violence, some suggestive sexual dialogue and/or situations.
TV-14	Parents Strongly Cautioned - This program is specifically designed to be viewed by adults and therefore may be unsuitable for children under 14. This program may contain sophisticated themes, sexual content, strong language and more intense violence.
TV-MA	Mature Audience Only - This program is specifically designed to be viewed by adults and therefore may be unsuitable for children under 17. This program may contain mature themes, profane language, graphic violence and explicit sexual content.

Subscriber-based satellite and cable television providers (programming distributors) typically give subscribers much more control and flexibility in blocking programming. This is achieved through the use of a more complex and often proprietary programming classification system (PCS). Often, a PCS includes a more detailed classifications scheme than the MPAA rating system. A PCS typically includes multiple PCS codes associated with the classifications that programming distributors. These PCS codes can be embedded in the television programming by the programming distributors at their head-end facility, may be included in a separate channel of the programming stream (such as in the electronic program guide, or EPG, data), or may be otherwise provided to the subscriber, such as via a telephone connection. In addition to the PCS, it is also common for programming distributors to allow users to block specific programs, for example by selecting them from the EPG.

Programming distributors normally implement such parental control methods via the television converter devices that they provide to their subscribers. Typically, a television converter device is required for each TV that the subscriber wished to view subscription television programming on. Television converter devices, thus, are designed to be collocated with a TV. Hence the name "television converter device." Subscribers can access the parental control menu via a password and select specific programming and/or programming classifications from the PCS to be blocked. Similar to the V-chip method, the television converter device stores this information and constantly compares it with the information in programming to be displayed, blocking that programming

that the subscriber has selected. The control and flexibility that these methods allow have been well-received by consumers and have become selling points for programming distributors.

Subscribers typically use parent controls on a TV-by-TV basis, i.e. the television programming they deem appropriate for one TV, say in the master bedroom, may not be appropriate for another TV, say the family room where children watch TV unattended. TV-by-TV control is easily implemented using either a V-chip method or the typical PCS method wherein an television converter device is necessary for each TV.

However, a recent trend in television converter device design is for programming distributors to provide their subscribers with one piece of equipment that can provide programming to multiple TVs at the subscriber's location. Such a television converter device is intended to be collocated with one TV (a primary TV), for example a central TV in a family room, but may be connected to one or more other TVs (secondary TVs), for example in the master bedroom, basement, and children's bedrooms. The typical television converter device outputs the same channel of television programming to all connected TVs, but can be controlled via remote controllers from any connected TV. Parents with such a television converter device can then use it to view programming on a secondary TV after the kids have gone to bed or whenever the primary TV is not in use. This innovation of providing one centralized television converter device per subscriber location, as opposed to one television converter device per subscriber TV, has created a problem with respect to the typical PCS method of blocking programming.

Now that the television converter device supports multiple TVs, there is a need to allow television converter device users to block programming to some TVs but not to others. For example, a means to allow violent movies to be displayed a secondary TV in the master bedroom, but not be displayed on the primary TV in the family room. In addition, such a novel parental control means should provide the same flexibility and control consumers have become used to. Furthermore, as it has become common for television converter devices and television converter devices to also store programming for later playback, a parental control means should also work for displaying stored programming. Lastly, such a parental control means should still be simple to use and inexpensive for the programming distributors to include in the television converter device.

#### SUMMARY OF THE INVENTION

The present invention solves these and other problems by combining the use of the V-chip technology now available in all TVs with the flexibility and control of a PCS in a television converter device. The television converter device of the present invention allows users to block programming based on PCS codes sent by the programming distributor. However, the television converter device does not actually block the programming based on the blocking level chosen by the user. Once the television converter device determines whether the programming is to be blocked or not it then inserts an appropriate V-code into the VBI of the programming before delivering it to the V-chip enabled TV where the V-chip blocks the programming as appropriate. This retains all control and flexibility that had previously been available to subscribers because of the PCS. Thus, while multiple TVs are connected to the television converter device, only those V-chip-equipped TVs with the appropriate V-chip blocking level will be able to display programming delivered by the television converter device.

The combined V-chip/PCS method described above has many advantages when used by a television converter device. It is fast. The television converter device's only job is to sample the PCS, compare it against the current blocking level and insert either a blocked V-code or a viewable V-code in the programming. It requires essentially the same internal processing power as current PCS enabled television converter devices, so it is of similar cost. It allows the V-chip system to be used in tandem with the PCS. Thus, the V-chip is still available to block over-the-air broadcast programming without interfering with the operation of the PCS. In this way, a single television converter device can serve multiple V-chip-equipped TVs each which can have a different blocking level.

The combined V-chip/PCS method is also suitable for providing parental control over viewing of programming stored on the television converter device. In an embodiment, recorded television programming is stored with its original PCS information. When playback is requested, the television converter device samples the PCS of the stored programming and inserts an appropriate V-code. In an alternative embodiment, the television converter device, while recording the programming, stores an appropriate V-code in the programming.

#### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1a illustrates an entertainment system utilizing a television converter device in accordance with an embodiment of the present invention.

FIG. 1b illustrates a simplified entertainment system comprising a television converter device connected to two TVs.

FIG. 2 is a functional block diagram of the logical elements of an embodiment of a television converter device in accordance with the present invention.

FIG. 3 illustrates the interconnectivity of logical elements of a television converter device in accordance with one embodiment of the present invention.

FIG. 4 illustrates the logical steps of one embodiment of a method of inserting a blocking code into television programming by a television converter device.

FIG. 5a presents a portion of a table showing PCS codes, a brief description of the content indicative of the PCS codes and the V-codes that correspond to the PCS Codes.

FIG. 5b presents the same portion of the table in FIG. 5a after it has been edited by a user to further restrict the display of television programming containing sexual themes.

FIG. 6 presents the logical steps of one embodiment of a method of inserting a blocking code into stored television programming by a television converter device.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

In this specification, the present invention will be described using methods and systems related to subscriber satellite television service. This specific description is not meant to limit the invention to that one embodiment. The present invention may also be applicable to cable television systems, broadcast television systems or other television systems. The present invention is also described in terms of digital video recorder (DVR) devices. The present invention may also be applicable to digital-versatile-disc (DVD) recording devices or other television recording devices. One skilled in the art will recognize that the present invention can apply elsewhere. While the invention has been particularly shown and described with reference to preferred embodiments thereof, it will be understood by those skilled in the art that various other

changes in the form and details may be made therein without departing from the spirit and scope of the invention.

As a general matter, the disclosure uses the term “signal.” One skilled in the art will recognize that the signal may be any digital or analog signal. Those signals may include, but are not limited to, a bit, a specified set of bits, an A/C signal, or a D/C signal. Uses of the term “signal” in the description may include any of these different interpretations. It will also be understood to one skilled in the art that the term “connected” is not limited to a physical connection but can refer to any means of communicatively or operatively coupling two devices.

As another general matter, the disclosure uses the terms “television converter,” “receiver,” “set-top-box,” “television receiving device,” “television receiver,” “television recording device,” “satellite set-top-box,” “satellite receiver,” “cable set-top-box,” “cable receiver,” and “television tuner” to refer interchangeably to a converter device or electronic equipment that has the capacity to acquire, process and distribute one or more television signals transmitted by broadcast, cable, telephone or satellite distributors. DVR and “personal video recorder (PVR)” refer interchangeably to devices that can record and play back television signals and that may implement trick functions including, but not limited to, fast-forward, rewind and pause. As set forth in this specification and the figures pertaining thereto, DVR and PVR functionality or devices may be combined with a television converter. The signals transmitted by these broadcast, cable, telephone or satellite distributors may include, individually or in any combination, internet, radio, television or telephonic data or information. One skilled in the art will recognize that a television converter device may be implemented as an external self-enclosed unit, a plurality of external self-enclosed units or as an internal unit housed within a television. One skilled in the art will recognize that the present invention can apply to analog and digital satellite set-top-boxes.

As yet another general matter, it will be understood by one skilled in the art that the term “television” refers to a television set or video display that may contain an integrated television converter device (e.g., an internal cable-ready television tuner housed inside a television) or, alternatively, that is connected to an external television converter device (e.g., an external set-top-box connected via cabling to a television). A further example of an external television converter device is the EchoStar Dish PVR 721, Part Number 106525, combination satellite set-top-box and DVR.

Finally, as a general matter, it should be understood that satellite television signals may be very different from broadcast television or other types of signals. Satellite signals may include multiplexed, packetized, and modulated digital signals. Once multiplexed, packetized and modulated, one analog satellite transmission may carry digital data representing several television stations or service providers. Some examples of service providers include HBO™, CSPAN™, ABC™, CBS™, or ESPN™. In satellite television, a service provider can also be compared to a “channel.”

The term “channel,” as used in this description, carries a different meaning from its normal connotation. In broadcast television, different analog signals of a television station may be carried on a carrier frequency and its sub-channels. A tuner in a television may then acquire and process these signals. In broadcast television, the term channel has thus become synonymous with the sub-channel or the station on that sub-channel. The normal connotation of the term “channel” is therefore not always appropriate to describe satellite television transmissions where multiple stations may be multiplexed onto a single carrier frequency. Satellite television

distributors, however, may organize the satellite data into a group of different “virtual channels.” These virtual channels give the impression that the satellite television programs (the service providers) are placed in channels. This impression may assist user operation of the satellite set-top-box since it models an analog television or analog receiving device. The virtual channels may appear in the electronic program guide (EPG) data and the user may choose programming by selecting a virtual channel. For instance, the user can select HBO, which may be on virtual channel 300, or CSPAN, which may be on virtual channel 210. These service providers or virtual channels are not necessarily carried in the same signal being sent from the same satellite. EPG data may come from a service provider (e.g., HBO), content provider (e.g., Disney), a third party (e.g., TV Guide) or from another outside entity. Thus, in satellite television service a channel may not be the same as in broadcast television service. Rather, channels may be more properly termed service providers in satellite television service. The term “channel” will be used in this description to describe the service providers and the virtual channels they may occupy.

Turning now to the Drawings, wherein like numbers denote like parts throughout the several views, FIG. 1a illustrates a subscriber’s entertainment system 101, and the general environment 102a of the subscriber’s location within which it operates, in accordance with an embodiment of the present invention. As illustrated in FIG. 1a, an entertainment system 101 comprises a centralized television converter device 100 that receives and distributes signals from one or more television programming distributors. FIG. 1a shows a generalized embodiment where the television converter device 100 may receive a signal 110 comprising multiple channels of television programming from a wireless content provider 114 (via a connected antenna 112), from a wired or cable content provider 116 (via a direct connection), and from a satellite content provider 104 (via a satellite 106 and a satellite communication device or antenna 108). Other embodiments are possible. For example, in one embodiment, the television converter device 100 may only receive and distribute signals from a cable content provider 116. In a preferred embodiment, the television converter device 100 is connected to and can receive signals from a satellite communications device 108, such as a home satellite dish, that is capable of recognizing and receiving transmitted signals from the satellite 106. The satellite 106 may be any type of satellite, for example a direct broadcast signal (DBS) satellite, designed to transmit signals containing television programming and other content such as music, audio, and internet content.

The television converter device 100, as illustrated in FIG. 1a, can be connected to several V-chip-equipped display devices for the delivery of content to the user. In this application, the term display device is used to indicate any device connected to the television converter device 100 that primarily delivers content directly to the user and is equipped with a V-chip. These include multiple traditional TVs 120, high definition TVs (HDTVs) 122, computer/monitor combinations (not shown) if used for the display of content delivered to it by the television converter device 100, simple monitors (not shown) adapted to receive signals directly from the television converter device 100, and a stereo 128. Furthermore, it is contemplated that the television converter device is collocated with a primary display device, while the balance of the multiple display devices (the secondary display devices) are distributed in various rooms throughout the subscriber’s location 101. It should also be noted that by stereo 128 this application refers to any type of primarily audio-only delivery

system and includes devices as simple as a speaker or headphones connected to the television converter device **100** through devices as complex as digital surround sound home theater systems and whole-house audio systems.

Although only one is specifically shown, the television converter device **100** may also be connected to several peripheral components (peripherals). Examples of peripherals include interactive content devices such as a telephone **130**, content capture devices such as a video camera **132** or microphone (not shown), external data storage and playback devices **134** such as a VCR **136** and DVD player **138**, and multipurpose devices such as the computer/monitor **124** and further includes a home local area network (LAN) **140** of such devices.

Another peripheral commonly included in an entertainment system **101** is one or more remote controllers (not shown). While most peripherals are typically, but not necessarily, physically connected to the television converter device **100** or other components by wire, remote controllers are typically connected to the television converter device **100** by an RF, IR or some other non-physical connection. For example, the EchoStar Technologies Corporation 1.5 Remote, model 123479171-AA has a pair of transmitters, an IR transmitter and an ultra high frequency (UHF) transmitter, that are used to send commands to a television converter device **100**.

The embodiment shown in FIG. **1a** also includes a connection to a standard telephone line **130** at the subscriber's location. The telephone connection may be used to deliver software to the television converter device (in addition to delivering software via the signal **110**) and to report the ordering of pay-per-view television programming from the television converter device. The use of a single television converter device to support all the TVs at a subscriber location eliminates the need to provide telephone line connects to each TV location.

FIG. **1b** shows a more specific environment **102b** wherein a television converter device **100** in accordance with the present invention is used to deliver television programming to two attached TVs **120a**, **120b**. The television converter device **100** receives a signal **110** containing multiple channels of television programming from a programming distributor. In this embodiment, the television converter device **100** is able to select channels of programming from the signal **110** and then deliver the selected channels to the two attached TVs **120a**, **120b**. In embodiments of the television converter device with internal or external storage capability, the user may also view programming that is stored on the television converter device's internal or external storage device, if any. The television converter device **100** is intended to be collocated with the primary TV **120a** while also being connected to the secondary TV **120b** that is located in another room. In alternative embodiments the television converter device may be connected to more than one secondary TV **120b**.

Also shown in FIG. **1b** are a primary remote controller **121a** and a secondary remote controller **121b**. The remote controllers **121a**, **121b** are a means for user control of the television converter device **100**. In addition, the television converter device **100** may also be equipped with an integral user keypad. In most embodiments, at least one primary remote controller **121a** and one secondary remote controller **121b** are provided. In alternative embodiments, one secondary remote controller is provided for each secondary TV **120b**. As noted before, it is typical for remote controllers to include IR or UHF transmitters for wireless communication with the television converter device **100**. Because it is assumed that in any particular instance only the primary TV **120a** is collocated with the television converter device **100**, in

one embodiment UHF transmitters are used in all secondary remote controllers **121b** for use with secondary TVs **120b**. This is because UHF signals can easily penetrate walls of a typical home and communicate with a remote television converter device **100**, whereas IR signals cannot. In another embodiment, a UHF and IR transmitters are included in all remote controllers **121a**, **121b**, thus allowing any remote controller to be used from any location. Other means of connecting remote controllers to a device such as a television converter device **100** that is in a different room are well known in the art, e.g. providing for each remote TV **120b** an IR sensor that is connected in some fashion to the television converter device **100**, and need not be described here.

In the embodiment shown in FIG. **1a** and FIG. **1b**, the television converter device **100** is implemented as a stand-alone device. One skilled in the art will recognize that it may be implemented in any number of ways and need not be a stand-alone device proximate to a TV within the subscriber's location as discussed in FIG. **1b**. For example, another embodiment of the present invention is a television converter device **100** designed to be located in a basement or some other central point at the subscriber's location that allows convenient connection to various devices in other rooms at the location. As another example, embodiments of the present invention may be implemented as part of a central home theater device that includes a display device and stereo sound system. A further example would be a home digital video storage library device, such as a DVD player with large capacity, large storage device, or a portal device to a remote video library. Such a library device would utilize the present invention to allow all the TVs at the subscriber's location to independently access television programming stored on or transmitted through the library device.

Furthermore, one skilled in the art will recognize that there are many different electronic means for implementing the television converter device **100**, regardless of the component, device or location of it. Such means include software means comprising television converter device software that can be executed at need on a processor within a component comprising the necessary hardware elements, firmware means wherein a fixed set of commands to be executed by a processor is embedded with the control circuitry of a component, hardware means wherein the television converter device is expressed as fixed circuits that perform the functions when operated, or some combination of software, firmware and hardware means.

FIG. **2** illustrates some of the logical elements included in a television converter device **200** in accordance with the present invention. FIG. **2** illustrates an embodiment of the television converter device **200** that contains a channel selector **201**. The term channel selector is used to describe an element that can select a television programming stream, commonly referred as a channel, from an input signal containing multiple channels of television programming and deliver the selected channel to an attached TV. In traditional analog devices, the channel selector is referred to as a tuner and a channel corresponds to a frequency on which an analog television programming stream is modulated. However, with the advent of digital signal transmission, channel selectors can be very different and significantly more complicated than simple analog frequency tuners. Thus, the term channel selector is used herein to avoid confusion and remind the reader that the invention applies equally to analog signals and digitally transmitted signals.

FIG. **2** shows the television converter device **200** also contains a storage device **208**. The storage device **208** is capable of recording and storing programming provided by any of the

channel selectors **200**. Furthermore, the storage device **208** is further adapted to retrieve stored programming and deliver it to any TV connected to the television converter device **200**. In embodiments, the television converter device **200** may also include a least one temporary buffer **204**. This buffer may comprise RAM or may simply be a portion of the storage device **208**. The buffer **204** is used to assist in the delivery of programming to the storage device **208** and, in some embodiments, to the connected TVs.

The television converter device **200** also contains control electronics **202** that control the operation of the channel selector **201** and the other logical elements contained in the television converter device **200**. One skilled in the art will realize that such control electronics **202** can take many forms, including a combination of hardware, software and firmware, while still providing the functionality described herein. For example, in one embodiment the control electronics **202** comprise a general purpose processor running software stored on memory. In another embodiment, the control electronics **202** comprise specially designed firmware.

Moving now to FIG. **3**, the interconnectivity of logical elements within a television converter device **300** in accordance with another embodiment is illustrated. While FIG. **3** shows an embodiment with one channel selector, it should be understood that any number of channel selectors **201** may be used in the television converter device **300** and still be within the scope of the present invention. While the embodiment shown in FIG. **3** does not show a separate temporary buffer, it should not be assumed that there is no buffer, only that any buffering capacity necessary is included with other elements. The channel selector **301** in the television converter device **300** is connected to the incoming signal **110** of multiple channels of television programming. In this embodiment, the channel selector selects a channel and delivers television programming on that channel as a digital data stream which can be carried the storage device and the connected TVs **121a**, **121b** as directed by the control electronics **302**.

In an alternative embodiment, an internal data bus **302** interconnects the channel selector **201**, the storage device **208**, the temporary buffer **204**, and the connected televisions **120**. In this embodiment, the channel selectors deliver the programming as a digital data stream which can be carried on the data bus or similar connections to any attached device as directed by the control electronics **202**.

In the embodiment shown in FIG. **3**, one or more the following methods of the present invention are performed by the control electronics **302**. In another embodiment (not shown), the methods may performed by a completely separate logic circuit which may then be considered a separate logical element.

Turning now to FIG. **4**, the logical steps of an embodiment of a general method **400** of inserting a blocking code into television programming by a television converter device based a first code embedded in a separate channel. In the embodiment shown, the first code is a PCS code embedded by a programming distributor into EPG data at the head end. The method **400** begins when the television converter device receives a manual input in the user command step **402** to deliver a specified channel of television programming to an attached TV. Examples of commands are a 'change channel' command (i.e. a command to display a different channel of television programming on a specific TV), a 'play stored programming' command, and a picture-within-picture (PIP) display command (to display a second channel of programming as a PIP display over a first channel that is already being displayed on a TV).

Upon receiving the user command, a channel selection step **404** uses a channel selector to select the channel specified in the user command step **402**. After the channel has been selected in the selection step **404**, a sampling step **406** samples or otherwise obtains the first code.

Next, the first code is compared to a lookup table to determine its corresponding V-code in the lookup step **408**. In the embodiment, the PCS provides more classifications than the MPAA rating system. A lookup table, that may or may not be editable by the user, is stored on the television converter device that identifies each PCS code with a specific V-code.

Based on the results of the lookup step **408**, the corresponding V-code will be inserted into the television programming by the insertion step **410**. The insertion of the V-code may or may not require the removal of other information contained in the VBI. For example, in another embodiment wherein the first code is embedded in the VBI of the television programming, the first code is replaced by the V-code inserted by the insertion step **410**.

After the V-code is inserted into the television programming by the insertion step **410**, the television programming is delivered to the connected TVs by the delivery step **412**. Delivery of the television programming to the connected TVs occurs regardless of the V-code inserted or the results of the lookup step **408**.

The sampling step **406**, lookup step **408**, insertion step **410** and delivering step **412** represent steps within a continuous data delivery process. In the embodiment, the sampling step samples the first code in the EPG at a specific interval, in this case at the beginning of every minute. Different intervals are possible and within the scope of this invention, as also is tying the sampling of the first code to additional information contained in the EPG, such as the time remaining in the current program. For example, the sampling step **406** may be performed at the initial channel change and not repeated until the scheduled end of the program (as determined from the EPG data). In another embodiment wherein the first code is embedded in the VBI of the television programming, the sampling step **406** may sample the first code contained within each VBI as it is received by the television converter device. Alternatively, the sampling step **406** may only sample some subset of VBIs, e.g. every tenth VBI, as the television converter device manufacturer deems appropriate. In any event, the method **400** continuously repeats the steps so that when the nature of the television programming changes, as reflected by a change in the first code, the inserted V-code is also changed.

The method **400** only inserts a V-code into the television programming delivered to the connected TVs. The V-chip on each of the connected TVs then will either permit or block display of the television programming depending on the blocking level selected. Thus, if the primary TV has a blocking level of TV-G, it will block display of television programming with an inserted V-code equal to more restrictive than TV-G, while a secondary TV with a different blocking level may display the same programming.

The delivery interrupt step **414** illustrates the repeating of the method **400**. The delivery interrupt step **414** causes the sampling step **406**, comparing step **408**, insertion step **410** and delivering step **412** to be repeated until the delivery is interrupted. The delivery may be interrupted by a user command or some other event that requires the television converter device to cease delivery of the specified television programming to the connected TVs. The method **400** ends when the delivery is ceased.

An example of a portion of one embodiment of a lookup table is presented in FIG. **5a**. The lookup table **500** of FIG. **5a** contains a list (as one column of the table **500**) of first codes

502, the description of the content of television programming described by the first code 504 (as a second column), and the V-code 506 corresponding to the first code 502. In the embodiment shown, the first codes are PCS codes. It will be understood to one skilled in the art that the PCS code need not be a single character and can take any number of forms, and the exact form is not important as long as the code can be recognized by the television converter device. Likewise, it will also be understood that the actual form of the lookup table 500 may be very different from that presented in FIG. 5a and the exact form is not important as long as the television converter device can determine a corresponding V-code for the PCS codes. The creation and use of lookup tables is well known in the art and a discussion of the forms and methods associated with them is not necessary here.

Some embodiments allow the user to edit the lookup table to tailor the blocking of television programming to his desires. Such an embodiment is shown in FIG. 5b, wherein the same portion of the lookup table as shown in FIG. 5a is presented after a user has edited it to more greatly restrict the display of sexually-themed television programming. The user has decided to treat all sexual television programming 508 as for mature audiences by changing the V-code 510 corresponding to first codes 512 having sexual content to be TV-MA. For violence and language, however, the user has chosen to follow the MPAA V-code ratings normally corresponding to those descriptions.

Turning now to FIG. 6, the logical steps of an embodiment of a general method 600 of inserting a blocking code into television programming stored on and subsequently retrieved by a television converter device based a first code provided by the programming distributor. In the embodiment shown, the first code is a PCS code embedded by a programming distributor at the head end into an EPG which is subsequently stored on the storage device as part of the initial recording of the television programming. The method 600 begins when the television converter device receives a manual input in the user command step 602 to deliver television programming stored on the television converter device.

Upon receiving the user command, a retrieval step 604 retrieves a first portion of the specified stored television programming. After retrieval of the first portion of the television programming, a sampling step 606 samples or otherwise obtains the first code associated with the stored television programming from the storage device.

Next, the first code is compared to a lookup table to determine its corresponding V-code in the lookup step 608. In the embodiment, the PCS provides more classifications than the MPAA rating system. A lookup table, that may or may not be editable by the user, is stored on the television converter device that identifies each PCS code with a specific V-code.

Based on the results of the comparison in the lookup step 608, a V-code will be inserted into the television programming by the insertion step 610. The insertion of the V-code may or may not require the removal of other information contained in the VBI. For example, in another embodiment wherein the first code is embedded in the VBI of the television programming, the first code is replaced by the V-code inserted by the insertion step 610.

After the appropriate V-code is inserted into the television programming by the insertion step 610, the television programming is delivered to the connected TVs by the delivery step 612. Delivery of the television programming to the connected TVs occurs regardless of the V-code inserted or the results of the lookup step 608.

The retrieval step 604, sampling step 606, lookup step 608, insertion step 610 and delivering step 612 represent steps

within a continuous data delivery process. In some embodiments, the first code is stored separately from the television programming and the sampling step 606 may be performed at the initial retrieval and not repeated until the scheduled end of the program (as determined from EPG data associated with the specific program that is also recorded and stored with the first code). For embodiments wherein the first code is recorded within the VBI of the television programming, the sampling step 606 may sample the first code contained within each VBI as it is retrieved by the television converter device. Alternatively, the sampling step 606 may only sample some subset of VBIs, e.g. every tenth vertical blanking interval, as the television converter device manufacturer deems appropriate.

In any event, the method 600 continuously repeats the steps so that if the nature of the retrieved television programming were to change, as reflected by a change in the first code, such programming then would be blocked, depending on the blocking level of each connected TV, by the method 600.

The delivery interrupt step 614 illustrates the repeating of the method 600. The delivery interrupt step 614 causes the retrieval step 604, sampling step 606, comparing step 608, insertion step 610 and delivering step 612 to be repeated until the delivery interrupted. The delivery may be interrupted by a user command or some other event that requires the television converter device to cease delivery of the specified television programming. The method 600 ends when the delivery is ceased at termination step 616.

Embodiments of the present invention also allow the user to make his own determination of what PCS classification specific programs should be in. In embodiments wherein the PCS information is stored in the EPG, the user can access and change, via an on-screen menu, the PCS classification of specific programs stored in the EPG. For example, if the user finds The Powerpuff Girls, The Movie particularly offensive, the user can access the parental controls and change the original PCS classification in the EPG of "The Powerpuff Girls, The Movie," whatever it may be, to a classification of extreme violence. Thus, based on the new PCS code of extreme violence, the television converter device would insert a TV-MA V-code upon delivery. Thus, only connected TVs with V-chips set to view TV-MA programming would be able to display "The Powerpuff Girls, The Movie." Note that in the embodiments the user may change to a more restrictive or to a less restrictive classification.

In embodiments wherein the PCS code is embedded with the television programming, the user can, again via an on-screen menu, select a specific program from the EPG (or in alternative embodiments manually input the channel, start time and duration of a specific program) and chose a blocking level for that specific program. This information is stored by the television converter device and, upon delivery of the specific program, the user-selected blocking level is used to determine the appropriate V-code rather than the embedded PCS code.

We claim:

1. A television converter device adapted to receive multiple television programs and content information concerning the multiple programs and deliver television programs to at least one television, the television converter device comprising:

a processor for controlling the operation of the television converter device;

at least one selector, capable of selecting at least one television program from the multiple television programs received and delivering the selected at least one television program to the at least one television;

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a means for converting a first type of blocking code associated with the at least one television program to a second type of blocking code based on a set of user modifiable correspondences between blocking codes of the first type of blocking code and blocking codes of the second type of blocking code and adding the second type of blocking code into the at least one television program prior to delivery; and

a means for transmitting the at least one television program to the at least one television, the second type of blocking code configured to block the at least one television program after delivery to the at least one television and the first type of blocking code not operable to block the at least one television program after delivery to the at least one television.

2. The television converter device of claim 1 further comprising:

- a storage device capable of recording, storing and retrieving television programs;
- and wherein the at least one selector is further capable of delivering the selected at least one television program to the storage device.

3. The television converter device of claim 1 wherein the first type of blocking code is a PCS code indicative of a rating classification of content of the at least one television program.

4. The television converter device of claim 3 wherein the PCS code is embedded in the at least one television program.

5. The television converter device of claim 4 wherein the PCS code is embedded in a vertical blanking interval of the at least one television program.

6. The television converter device of claim 3 wherein the PCS code is embedded in a television program other than the at least one television program to be delivered.

7. The television converter device of claim 3 wherein the PCS code is embedded in scheduling information provided by a satellite service.

8. The television converter device of claim 3 further comprising

- a lookup table comprising a list of PCS codes and their corresponding blocking codes.

9. The television converter device of claim 8 wherein the lookup table may be edited by a user to change the corresponding blocking codes.

10. The television converter device of claim 1 wherein the second type of blocking code is a V-code.

11. The television converter device of claim 1, wherein adding the second type of blocking code replaces the first type of blocking code.

12. A method of adding one or more blocking codes into television programs delivered by a television converter device to at least one television, the method comprising the steps:

- receiving a command to display at least one television program on at least one television;
- reading a first type of blocking code associated with the at least one television program;
- converting the first type of blocking code into a second type of blocking code that corresponds to the first type of blocking code based on a set of correspondences between each possible blocking code of the first type of blocking code and blocking codes of the second type of blocking code;
- adding the second type of blocking code into the at least one television program.

13. The method of claim 12 wherein the second type of blocking code causes the at least one television to block display of the delivered at least one television program.

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14. The method of claim 12 wherein the second type of blocking code is a V-code.

15. The method of claim 12 wherein the first type of blocking code is a rating classification blocking code.

16. The method of claim 15 wherein the television converter device further comprises a lookup comprising rating classification blocking codes and corresponding second type of blocking codes.

17. The method of claim 12 wherein the second type of blocking code is inserted in a vertical blanking interval of the at least one television program.

18. The method of claim 12 wherein the first type of blocking code is embedded in a second television program.

19. The method of claim 18 wherein the television program comprises data used in an electronic program guide.

20. The method of claim 12 wherein the first type of blocking code is embedded in the vertical blanking interval of the at least one television program.

21. The method of claim 12 wherein the at least one television program is delivered to the television converter device from a storage device.

22. The method of claim 12 wherein the at least one television is equipped with a V-chip.

23. The method of claim 12 further comprising the step: delivering the at least one television program, including the added second type of blocking code, to the at least one television.

24. The method of claim 12 further comprising the step: storing the at least one television program, including the added second type of blocking code, on a storage device.

25. The method of claim 12, wherein adding the second type of blocking code replaces the first type of blocking code.

26. A method of using an television converter device to cause a television to block the display of television programming, the method comprising the steps:

- determining a first blocking code associated with at least one television program to be delivered to at least one television by a television converter device;
- converting the first blocking code into a V-code at least based on user preferences and a set of correspondences between blocking codes of the first type of blocking code and blocking codes of the second type of blocking code;
- adding, by the television converter device, the V-code into the at least one television program; and
- transmitting the at least one television program to the at least one television.

27. The method of claim 26 wherein the V-code causes the at least one television to block the display of the delivered at least one television program.

28. The method of claim 26 wherein the first blocking code is embedded within the at least one television program.

29. The method of claim 26 wherein the first blocking code is embedded in a television program other than the at least one television program.

30. The method of claim 29 wherein said converting the first blocking code into a V-code at least based on user preferences comprises:

- converting the first blocking code into the V-code at least based on user preferences and a schedule of television programming and ratings associated with the at least one television program.

31. The method of claim 29 wherein the V-code corresponds to the first blocking code on a lookup table stored on the television converter device.



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32. The method of claim 26 wherein the V-code is inserted in a vertical blanking interval of the at least one television program.

33. The method of claim 26, wherein adding the V-code replaces the first blocking code.

34. A method of implementing television content control for a television program received by a set-top-box in a home and then rebroadcast in analog format to one or more televisions in the home, the method comprising:

detecting at the set-top-box a first blocking code associated with at least one program being received by the set-top-box in the home;

converting the received first blocking code into a corresponding analog content code based on a set of user modifiable correspondences between each possible blocking code of the first type of blocking code and at least one of each possible analog content code;

adding the analog content code into the rebroadcast of the at least one program in analog format; and

transmitting the at least one program to the one or more televisions, the at least one program configured to block display based on the analog content code.

35. The method of claim 34 wherein the corresponding analog content code is a V-chip code.

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36. The method of claim 34 wherein the analog content code is inserted into the vertical blanking interval of the rebroadcast of the at least one program in analog format.

37. The method of claim 36 wherein the corresponding analog content code is a V-chip code.

38. The method of claim 34, wherein adding the analog content code replaces the first blocking code.

39. A method of implementing television content control, the method comprising the steps:

detecting at a set-top-box a first type of blocking code associated with at least one program being received by the set-top-box;

converting the first type of blocking code into a corresponding second type of blocking code based on a set of user modifiable correspondences between blocking codes of the first type of blocking code and blocking codes of the second type of blocking code;

adding the second type of blocking code to the at least one program prior to delivery; and

transmitting the at least one program to one or more televisions, the at least one program configured to block display based on the second type of blocking code.

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